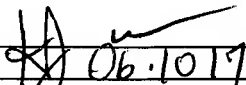
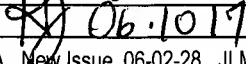


Date: Tuesday, 10/17/2006 11:20:10 AM  
 User: Kim Johnston

## Process Sheet

<b>Customer</b> : CU-DAR001 Dart Helicopters Services	<b>Drawing Name</b> : BLADE FITTING
<b>Job Number</b> : 29043	
<b>Estimate Number</b> : 12300	
<b>P.O. Number</b> : N/A	<b>Part Number</b> : D3488042
<b>This Issue</b> : 10/17/2006 <b>S.O. No.</b> : N/A	<b>Drawing Number</b> : D3488 / DSK101
<b>Prsht Rev.</b> : NC	<b>Project Number</b> : N/A
<b>First Issue</b> : N/A <b>Type</b> : MACHINED PARTS	<b>Drawing Revision</b> : B/ED 06-10-17
<b>Previous Run</b> : 28319	<b>Material</b> : N/A
<b>Written By</b> : 	<b>Due Date</b> : 11/15/2006 <b>Qty:</b> 20 <b>Um:</b> 24 <b>Each</b>
<b>Checked &amp; Approved By</b> :  06.10.17	
<b>Comment</b> : Est Rev:A New Issue 06-02-28 JLM Est Rev:B As per Rev B 06-03-30 JLM	

## Additional Product

Job Number:



<b>Seq. #:</b>	<b>Machine Or Operation:</b>	<b>Description :</b>
----------------	------------------------------	----------------------

1.0	D6103003	alum billet
-----	----------	-------------

**Comment:** Qty.: 1.0000 Each(s)/Unit Total : 24.0000 Each(s)

Alluminum Round Billet D6103-003

Batch: 25572

BG 06.10.22

20

2.0	MORI SEIKI	MORI SEIKI CNC LATHE LARGE
-----	------------	----------------------------

**Comment:** MORI SEIKI CNC LATHE LARGE

1-Turn as per Dwg DSK 101 &amp; Folio FA627

2-Deburr

BG 06.10.22

20

3.0	QC2	INSPECT PARTS AS THEY COME OFF MACHINE
-----	-----	--

**Comment:** INSPECT PARTS AS THEY COME OFF MACHINE

BG 06.10.22

20

4.0	HAAS1	HAAS CNC VERTICAL MACHINING #1
-----	-------	--------------------------------

**Comment:** HAAS CNC VERTICAL MACHINING #1

1-Machine as per Folio FA627 &amp; Dwg D3488

2-Deburr

En/S.G

06/12/13

P+0

18

5.0	QC2	INSPECT PARTS AS THEY COME OFF MACHINE
-----	-----	--

**Comment:** INSPECT PARTS AS THEY COME OFF MACHINE

En/S.G

06/12/13

18

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: D3488-042 PAR #: \_\_\_\_\_ Fault Category: Prod / Machine Parts NCR: (Yes) No DQA: P Date: 07/01/03  
 QA: N/C Closed: KA Date: 07/01/08

NCR: <u>29043</u>		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			
06/12/11	4.0	x origin was taken wrong (operator error). Total hole position was shifted 0.100" Part is scrap or affected.	<u>per QSE 06.12.11</u>	Fixed origin. Scrap / destroy and cannot Replace.	<u>Ep 06/12/11</u>	<u>06-12-11</u>	<u>per QSE 042 06.12.11 see attached</u>	<u>06-12-11</u>
06/12/11	4.0	one part was milled at 11.0735" instead of 11.18" ( $\pm 0.030$ )	<u>06/12/11</u>	Problems with machine correcting foil's. Scraps destroyed. Foil has been fixed by Eric Chapman.	<u>Ep 06/12/11</u>	<u>06-12-11</u>	<u>06/12/11</u>	<u>06-12-11</u>

NOTE: Date & initial all entries

Date: Tuesday, 10/17/2006 11:20:10 AM  
User: Kim Johnston

## Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: BLADE FITTING

Job Number: 29043

Part Number: D3488042

Job Number:



Seq. #:

Machine Or Operation:

Description :

6.0

QC8

SECOND CHECK



Comment: SECOND CHECK

SN 06.12.13

7.0

HAND FINISHING1

HAND FINISHING RESOURCE #1



Comment: HAND FINISHING RESOURCE #1

Chemical Conversion Coat as per QSI 005 4.1

8.0

POWDER COATING

POWDER COATING



Comment: POWDER COATING

Powder Coat White Gloss (Ref: 4.3.5.1) as per QSI 005 4.3

9.0

QC3

INSPECT POWDER COAT/CHEMICAL CONVERSION



Comment: INSPECT POWDER COAT/CHEMICAL CONVERSION

Q.M 06/12/22

(18v)

10.0

ALS71032225

INSERT



Comment: Qty.: 4.0000 Each(s)/Unit Total: 96.0000 Each(s)

Pick:

Qty Part Number Description Batch

4 ALS7-1032-225 Insert M19393

Q.M 06/12/27

(18v)

11.0

HAND FINISHING1

HAND FINISHING RESOURCE #1



Comment: HAND FINISHING RESOURCE #1

Install Inserts as per Dwg D3488

Q.M 06/12/27

06/12/27

(18v)

12.0

QC5

INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP

M 07/01/02

(18v)

13.0

PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

Identify and Stock

Location: FP

M 07/01/02

(18v)

**Dart Aerospace Ltd**

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

**NOTE:** Date & initial all entries

Date: Tuesday, 10/17/2006 11:20:10 AM  
User: Kim Johnston

## Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: BLADE FITTING

Job Number: 29043

Part Number: D3488042

Job Number:



Seq. #:

Machine Or Operation:

Description :

14.0

QC21

FINAL INSPECTION/W/O RELEASE



(18)

Comment: FINAL INSPECTION/W/O RELEASE

707/01/03

Job Completion



U 57-01.03

# Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

<b>DART AEROSPACE LTD</b>		<b>Work Order:</b>	29043
<b>Description:</b> Blade Fitting, RH		<b>Part Number:</b>	D3488-2
<b>Inspection Dwg:</b> D3488	<b>Rev:</b> B	<b>Page 1 of 1</b>	

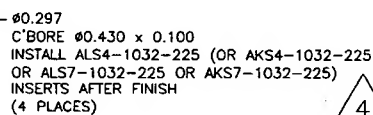
### FIRST ARTICLE INSPECTION CHECKLIST

☒ First Article ☐ Prototype

Drawing Dimension	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
0.125	+/-0.010	0.123	✓			
2.620	+/-0.010	2.622	✓			
0.793	+/-0.010	0.791	✓			cannot GET AN ACCURATE
1.351	+/-0.010	1.344	✓			06/12/11
1.317	+/-0.010	1.320	✓			
90°	+/-0.1°	90°	✓			
1.802	+/-0.010	1.802	✓			
Ø0.508	+0.006/-0.001	0.510	✓			
R0.062	+/-0.010	0.062	✓			
1.500	+/-0.010	1.500	✓			
8.000	+0.030/-0.000	8.003	✓			
11.18	+/-0.030	11.795	✓			
Ø0.484	+0.005/-0.001	0.484	✓			
1.180	+/-0.010	1.179	✓			
3.150	+/-0.010	3.151	✓			
h 3.070	+/-0.010	3.069	✓			
h 0.590	+/-0.010	0.591	✓			
0.125	+/-0.010	0.129	✓			
h 1.005	+/-0.010	1.004	✓			
3.500	+/-0.010	3.497	✓			
Ø0.297	+0.005/-0.000	0.297	✓			
Ø0.430	+/-0.010	0.430	✓			
0.100	+/-0.010	0.098	✓			

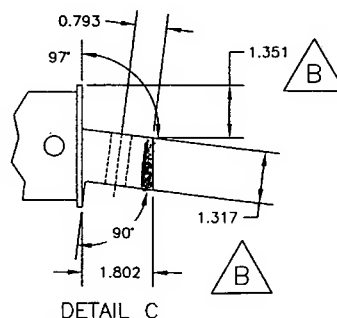
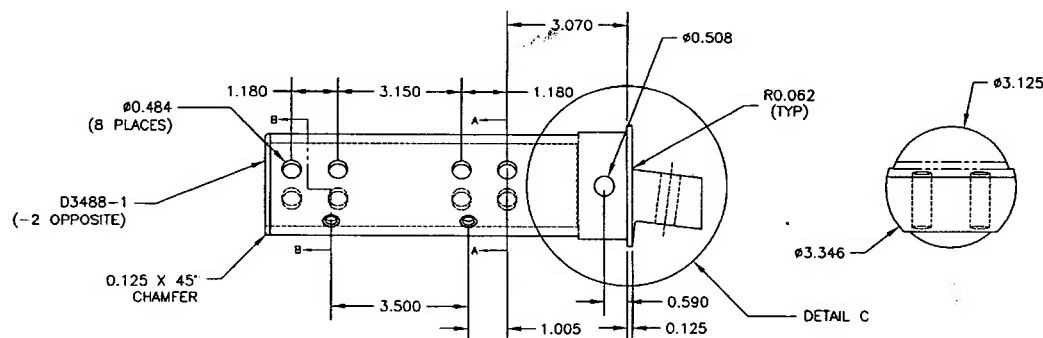
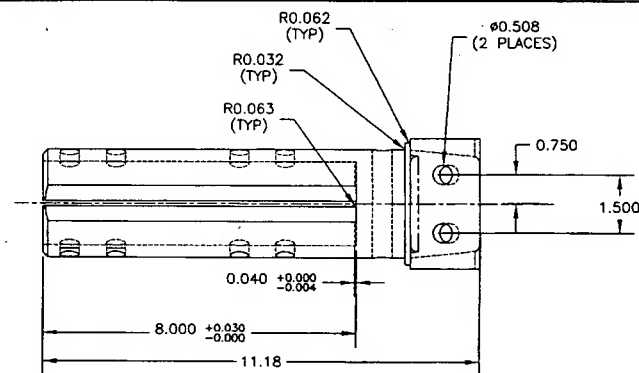
<b>Measured by:</b>	Σ	<b>Audited by:</b>	JL	<b>Prototype Approval:</b>	N/A
<b>Date:</b>	06/12/11	<b>Date:</b>	06/12/11	<b>Date:</b>	N/A

Rev	Date	Change	Revised by	Approved
A	06.03.31	New Issue	KJ/JLM	Σ




QTY -041	QTY -042	PART NUMBER	DESCRIPTION
X	X	D3488-041	BLADE FITTING ASSEMBLY (LH)
		D3488-042	BLADE FITTING ASSEMBLY (RH)
1		D3488-1	BLADE FITTING (LH)
	1	D3488-2	BLADE FITTING (RH)
4	4	ALS4-1032-225 or AKS4-1032-225 or ALS7-1032-225 or AKS7-1032-225	INSERT

- 1) MATERIAL: MAKE D3488-1/-2 FROM ALUMINUM 7075-T7351 ROUND BAR  
PER QQ-A-225/9  
(REF. DART MATERIAL SPEC M7075T73R)
- 2) FINISH: ACID ETCH, ALODINE PER DART QSI 005 4.1  
POWDER COAT WHITE (REF 4.3.5.1) PER DART QSI 005 4.3
- 3) BREAK UNMARKED SHARP EDGES 0.010 TO 0.020
- 4) INSTALL INSERTS AFTER POWDER COAT
- 5) ALL DIMENSIONS ARE IN INCHES
- 6) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED



D3488-041 SHOWN (D3488-042 OPPOSITE)

RELEASED  
04.03.29 AM  
PER OS  
FIN #789

B	06.03.15	CHANGE THICKNESS	
A	05.12.20	NEW ISSUE	
DESIGN	DRAWN BY	 <b>DART AEROSPACE USA, INC.</b> PORT HADLOCK, MA	
CHECKED	APPROVED	DRAWING NO.	REV. E
DATE		D3488	SHEET 1 OF
06.03.15		TITLE	SCALE
		BLADE FITTING	1:2

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DART AEROSPACE USA, INC.

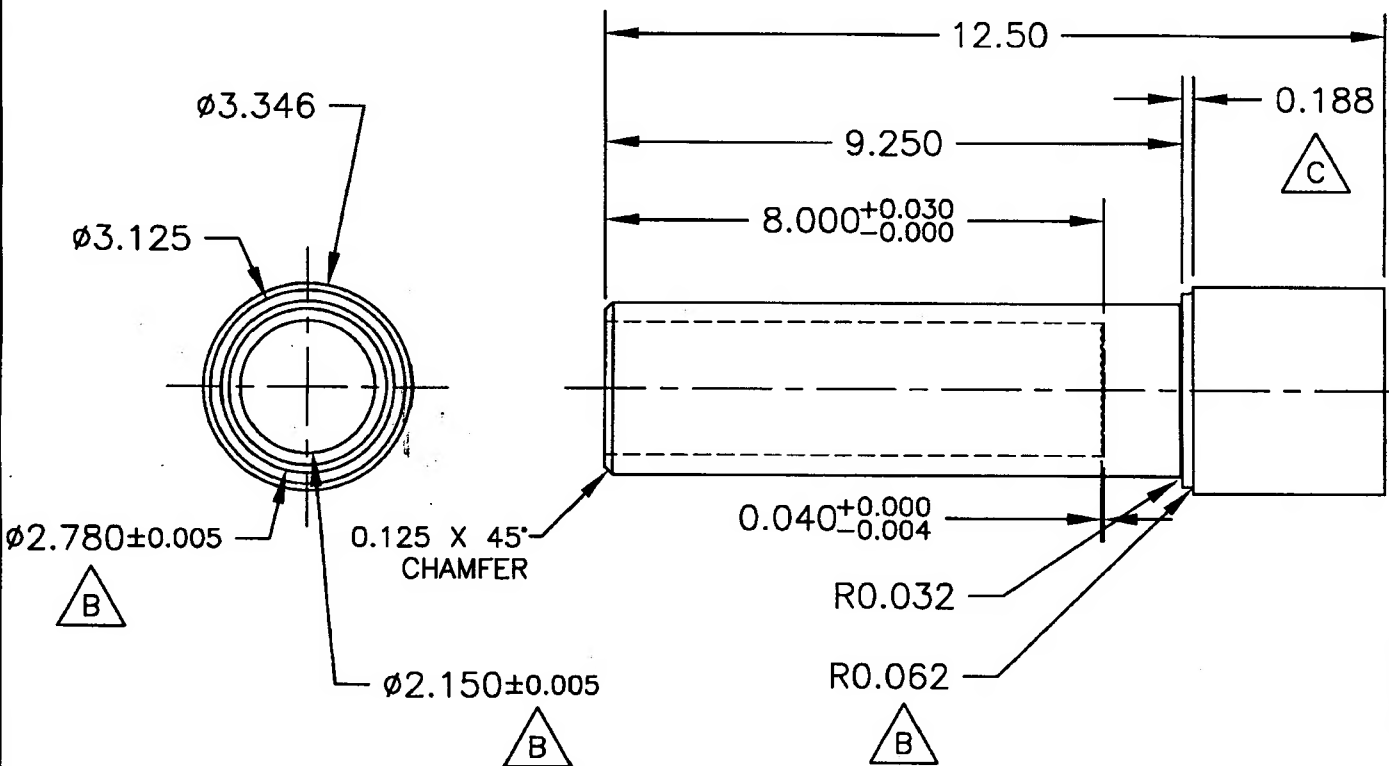
UNCONTROLLED COPY  
SUBJECT TO AMENDMENT  
WITHOUT NOTICE  
WORK ORDER  
NO. 29043

0.2431  
0.1485



**DART**

DESIGN	DRAWN BY	DART AEROSPACE USA, INC.	
04	04	PORT HADLOCK, WA	
CHECKED	APPROVED	DRAWING NO.	REV. D
<i>[Signature]</i>	<i>[Signature]</i>	DSK 101	SHEET 1 OF 1
DATE	TITLE	SCALE	
06.05.09	D3488-1/-2 TURNING DETAIL	1:3	
A	05.12.21	NEW ISSUE	
B	06.03.02	ADD TOLERANCES AND RADIUS	
C	06.04.17	0.188 WAS 0.125	
D	06.05.09	REMOVE DIAMETER FOR CHAMFER	



DSK 101

- 1) MATERIAL: MAKE FROM ALUMINUM 7075-T7351 ROUND BAR PER QQ-A-225/9 (REF. DART MATERIAL SPEC M7075T73R)
- 2) FINISH: NONE
- 3) BREAK UNMARKED SHARP EDGES 0.010 TO 0.020
- 4) ALL DIMENSIONS ARE IN INCHES
- 5) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED

SHOP COPY  
RETURN TO  
ENGINEERING  
UNCONTROLLED COPY  
SUBJECT TO AMENDMENT  
WITHOUT NOTICE  
WORK ORDER  
NO. 29043

## L Lacelle

---

**From:** David Shepherd [dshepherd@dartaero.com]  
**Sent:** October 23, 2006 12:26 PM  
**To:** 'Peter Hum'  
**Cc:** 'Serge Shahbazian'; 'Linda Lacelle (Linda Lacelle)'; 'Bill Beckett'; 'Susanne Sheldon'; 'Dale Trepanier'  
**Subject:** RE: 350 SKIDTUBES - D3488 blade fitting

Peter,

To answer your question, I will reluctantly accept these parts. 7075-T6 has better mechanical properties than 7075-T73, but is more susceptible to SCC and because this part is on the ground and potentially installed with floats, it will be a very corrosive environment. I would not worry about trying to make 20 LH parts to match.

However, in talking to you, we should never have gotten into this situation. Looks like we didn't properly check the certs when the material showed up at the door and we made the parts before we realized the problem. I ASSUME AN NCR HAS BEEN GENERATED TO LOOK INTO THIS.

Susanne,

I think we need to have a closer look at our inspection procedures in general. I am aware of 3-4 situations in the last week where we made parts from the wrong materials or shipped the wrong hardware or shipped kits with parts installed backwards or signed off for processes that were not even completed on the parts.

David

-----Original Message-----

**From:** Peter Hum [mailto:phum@dartaero.com]  
**Sent:** Monday, October 23, 2006 7:12 AM  
**To:** 'David Shepherd'  
**Cc:** Serge Shahbazian; Linda Lacelle (Linda Lacelle); Bill Beckett  
**Subject:** FW: 350 SKIDTUBES - D3488 blade fitting

David,

We have manufactured the D3488-042 blade fitting used on the 350 skids using 7075-T6....the dwg calls for 7075-T73....we have accepted this before (see below, May 8 2006)

- 1) Is this acceptable from a strength and certification point of view?
- 2) If the answer to 1) is Yes would we have to make 20 LH's to match (i.e to pair everything up)?

It would be difficult to pair blade fittings up because we would have to ship 20 pairs of the D350-636 skidtubes exclusively. I am worried that customers receiving replacements will have 1 side made to T73 and another to T6.

Peter

-----Original Message-----

**From:** L Lacelle [mailto:llacelle@dartaero.com]  
**Sent:** October 23, 2006 8:37 AM  
**To:** 'Peter Hum'  
**Subject:** RE: 350 SKIDTUBES - D3488 blade fitting

20 RH's were turned...The reason they didn't see it was the old style, was that we received one last batch of the D6103-001's at 3.5" od, instead of 3.25.....please let me know if we can still use or not Thx Linda

-----Original Message-----

**From:** Peter Hum [mailto:phum@dartaero.com]  
**Sent:** October 23, 2006 8:31 AM

\*To: Linda Lacelle (Linda Lacelle)  
Subject: FW: 350 SKIDTUBES - D3488 blade fitting

Linda,

Below are the comments from the previous conversations....Can you e-mail me back with the qty and handed of the affected parts

Thanks  
Peter

-----Original Message-----

From: David Shepherd [mailto:davids@dartaero.com]  
Sent: May 8, 2006 11:25 AM  
To: Peter Hum  
Cc: Linda Lacelle; Bill Beckett  
Subject: Re: 350 SKIDTUBES

Peter,

I DON'T think we should be using the T6 for this part.  
At the last revision, we made a decision to go with T73 because of resistance to SCC.

If there is no other way around it, then I think we can use the T6, but I think we are compromising.

David

----- Original Message -----

From: "Peter Hum" <phum@dartaero.com>  
To: "David Shepherd (E-mail)" <davids@dartaero.com>  
Cc: "Linda Lacelle (E-mail)" <lindal@dartaero.com>  
Sent: Monday, May 08, 2006 8:52 AM  
Subject: FW: 350 SKIDTUBES

> David,  
>  
> Please read the e-mail below:  
>  
> Upon inspection of the attached MIL hdbk sheet for 7075, it appears  
> that  
the  
> T6 tempering has better (stronger UTS, YTS) strength than the T73 it  
> would replace.  
>  
> Is changing the material for this batch acceptable?  
>  
> Thanks,  
> Peter  
>

> -----Original Message-----

> From: Linda Lacelle [mailto:llacelle@dartaero.com]  
> Sent: Monday, May 08, 2006 10:44 AM  
> To: Peter Hum (E-mail)  
> Subject: FW: 350 SKIDTUBES  
>  
>

> sorry, i mean T6/T6511  
>

> -----Original Message-----

> From: Linda Lacelle [mailto:llacelle@dartaero.com]  
> Sent: Monday, May 08, 2006 10:42 AM  
> To: 'Peter Hum'  
> Subject: RE: 350 SKIDTUBES  
>  
>

> Can we use the 7075-T73??  
>

> -----Original Message-----

> From: Peter Hum [mailto:phum@dartaero.com]  
> Sent: Monday, May 08, 2006 10:27 AM  
> To: 'Linda Lacelle'  
> Cc: Jean-Luc Menard (E-mail)  
> Subject: RE: 350 SKIDTUBES  
>  
>  
> DSK 101 REV C.  
>  
> Jean-Luc and I will have a look over the DSK  
>  
> Peter  
>  
> -----Original Message-----  
> From: Linda Lacelle [mailto:llacelle@dartaero.com]  
> Sent: Monday, May 08, 2006 10:21 AM  
> To: Bill Beckett (E-mail); Peter Hum (E-mail); S Shahbazian (E-mail)  
> Subject: 350 SKIDTUBES  
>  
>  
>  
> Our supplier made a mistake on the new blade fittings for the new 350  
> skidtubes...he will take full responsibility for the material  
> (D6103-003 - \$2338.00), but this leaves us with no material..I have  
> checked 3 different places, and the best is May 16th, then they have  
> to  
be  
> turned , milled, and painted...so the May 15th date in stock is not  
> realistic. I would also like someone to look at the drwg, it has an  
> arrow over another, leaving some confusion to the ID. Our supplier has  
> a machine standing by ready to turn the new billets the minute they come in.  
> LL  
>

--

No virus found in this incoming message.  
Checked by AVG Free Edition.  
Version: 7.1.408 / Virus Database: 268.13.11/492 - Release Date: 10/23/2006

--

No virus found in this outgoing message.  
Checked by AVG Free Edition.  
Version: 7.1.408 / Virus Database: 268.13.11/492 - Release Date: 10/23/2006

## Peter Hum

---

**From:** David Shepherd [dshepherd@dartaero.com]  
**Sent:** December 11, 2006 11:28 AM  
**To:** 'Peter Hum'  
**Subject:** RE: D3488 part out of tolerance

Peter,

While I think we could rationalize that this part is acceptable from an airworthy point of view, it is going to look really funny from an esthetics point of view.  
I recommend that we scrap the part.

David

---

**From:** Peter Hum [mailto:phum@dartaero.com]  
**Sent:** Monday, December 11, 2006 8:49 AM  
**To:** 'David Shepherd'  
**Subject:** D3488 part out of tolerance

David,

The D3488 part is out of tolerance by 0.100" as shown in the attachment. This deviation will cause this part to stick out from the end by 0.100". This was due to operator error, the origin was taken at the wrong location.

Is this part scrap?

Peter

P.S. For these dispositions (over \$100, per QSI 042) similar to this one, would it be appropriate to ask B Beckett?

--  
No virus found in this incoming message.  
Checked by AVG Free Edition.  
Version: 7.1.409 / Virus Database: 268.15.15/580 - Release Date: 12/8/2006

--  
No virus found in this outgoing message.  
Checked by AVG Free Edition.  
Version: 7.1.409 / Virus Database: 268.15.15/580 - Release Date: 12/8/2006

11/12/2006